

Pt. 135, App. D

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Parameters	Range	Installed system ¹ minimum accuracy (to recovered data)	Sampling interval (per second)	Resolution ³ read out
Radio transmitter keying (discrete).	On/off .....	.....	1.	
Autopilot engaged (discrete) ..	Engaged or disengaged .....	.....	1.	
SAS status—engaged (discrete).	Engaged/disengaged .....	.....	1.	
SAS fault status (discrete)	Fault/OK .....	.....	1.	
<i>Flight Controls</i>				
Collective ⁴	Full range	±3%	2	1% ²
Pedal Position ⁴	Full range	±3%	2	1% ²
Lat. Cyclic ⁴	Full range	±3%	2	1% ²
Long. Cyclic ⁴	Full range	±3%	2	1% ²
Controllable Stabilator Position ⁴ .	Full range	±3%	2	1% ²

¹When data sources are aircraft instruments (except altimeters) of acceptable quality to fly the aircraft the recording system excluding these sensors (but including all other characteristics of the recording system) shall contribute no more than half of the values in this column.

²Per cent of full range.

³This column applies to aircraft manufactured after October 11, 1991.

⁴For all aircraft manufactured on or after December 6, 2010, the sampling interval per second is 4.

[Doc. No. 25530, 53 FR 26152, July 11, 1988; 53 FR 30906, Aug. 16, 1988, as amended by Amdt. 135–69, 62 FR 38397, July 17, 1997; Amdt. 135–113, 73 FR 12570, Mar. 7, 2008; 73 FR 15281, Mar. 21, 2008; Amdt. 135–121, 75 FR 17047, Apr. 5, 2010]

APPENDIX D TO PART 135—AIRPLANE FLIGHT RECORDER SPECIFICATION

Parameters	Range	Accuracy sensor input to DFDR readout	Sampling interval (per second)	resolution ⁴ read out
Time (GMT or Frame Counter) (range 0 to 4095, sampled 1 per frame).	24 Hrs	±0.125% Per Hour	0.25 (1 per 4 seconds).	1 sec.
Altitude	– 1,000 ft to max certified altitude of aircraft.	±100 to ±700 ft (See Table 1, TSO-C51a).	1	5' to 35' ¹ .
Airspeed	50 KIAS to V _{so} , and V _{so} to 1.2 V _D .	±5%, ±3%	1	1kt
Heading	360°	±2°	1	0.5°
Normal Acceleration (Vertical)	–3g to +6g	±1% of max range excluding datum error of ±5%.	8	0.01g
Pitch Attitude	±75°	±2°	1	0.5°
Roll Attitude	±180°	±2°	1	0.5°.
Radio Transmitter Keying	On-Off (Discrete) .....	.....	1	
Thrust/Power on Each Engine	Full range forward	±2%	1 (per engine) ...	0.2% ² .
Trailing Edge Flap or Cockpit Control Selection.	Full range or each discrete position.	±3° or as pilot's indicator	0.5	0.5% ² .
Leading Edge Flap on or Cockpit Control Selection.	Full range or each discrete position.	±3° or as pilot's indicator	0.5	0.5% ² .
Thrust Reverser Position	Stowed, in transit, and reverse (discretion).	.....	1 (per 4 seconds per engine).	
Ground Spoiler Position/Speed Brake Selection.	Full range or each discrete position.	±2% unless higher accuracy uniquely required.	1	0.22 ² .
Marker Beacon Passage	Discrete .....	.....	1	
Autopilot Engagement	Discrete .....	.....	1	
Longitudinal Acceleration	±1g	±1.5% max range excluding datum error of ±5%.	4	0.01g.
Pilot Input And/or Surface Position-Primary Controls (Pitch, Roll, Yaw) ³ .	Full range	±2° unless higher accuracy uniquely required.	1	0.2% ² .
Lateral Acceleration	±1g	±1.5% max range excluding datum error of ±5%.	4	0.01g.
Pitch Trim Position	Full range	±3% unless higher accuracy uniquely required.	1	0.3% ² .
Glideslope Deviation	±400 Microamps	±3%	1	0.3% ² .
Localizer Deviation	±400 Microamps	±3%	1	0.3% ² .
AFCs Mode And Engagement Status.	Discrete .....	.....	1	
Radio Altitude	–20 ft to 2,500 ft	±2 Ft or ±3% whichever is greater below 500 ft and ±5% above 500 ft.	1	1 ft + 5% ² above 500'.
Master Warning	Discrete .....	.....	1	

Parameters	Range	Accuracy sensor input to DFDR readout	Sampling interval (per second)	resolution ⁴ read out
Main Gear Squat Switch Status.	Discrete .....	.....	1	
Angle of Attack (if recorded directly).	As installed	As installed	2	0.3% ² .
Outside Air Temperature or Total Air Temperature.	−50 °C to +90 °C	±2° c	0.5	0.3° c
Hydraulics, Each System Low Pressure.	Discrete .....	.....	0.5	or 0.5% ² .
Groundspeed	As installed	Most accurate systems installed (IMS equipped aircraft only).	1	0.2% ² .

If additional recording capacity is available, recording of the following parameters is recommended. The parameters are listed in order of significance:

Drift Angle	When available. As installed.	As installed	4	
Wind Speed and Direction	When available. As installed.	As installed	4	
Latitude and Longitude	When available. As installed.	As installed	4	
Brake pressure/Brake pedal position.	As installed	As installed	1	
Additional engine parameters:				
EPR	As installed	As installed	1 (per engine) ...	
N ¹	As installed	As installed	1 (per engine) ...	
N ²	As installed	As installed	1 (per engine) ...	
EGT	As installed	As installed	1 (per engine) ...	
Throttle Lever Position	As installed	As installed	1 (per engine) ...	
Fuel Flow	As installed	As installed	1 (per engine) ...	
TCAS:				
TA	As installed	As installed	1	
RA	As installed	As installed	1	
Sensitivity level (as selected by crew).	As installed	As installed	2	
GPWS (ground proximity warning system).	Discrete .....	.....	1	
Landing gear or gear selector position.	Discrete .....	.....	0.25 (1 per 4 seconds).	
DME 1 and 2 Distance	0–200 NM;	As installed	0.25	1mi.
Nav 1 and 2 Frequency Selection.	Full range	As installed	0.25.	

¹ When altitude rate is recorded. Altitude rate must have sufficient resolution and sampling to permit the derivation of altitude to 5 feet.

² Per cent of full range.

³ For airplanes that can demonstrate the capability of deriving either the control input on control movement (one from the other) for all modes of operation and flight regimes, the "or" applies. For airplanes with non-mechanical control systems (fly-by-wire) the "and" applies. In airplanes with split surfaces, suitable combination of inputs is acceptable in lieu of recording each surface separately.

⁴ This column applies to aircraft manufactured after October 11, 1991.

[Doc. No. 25530, 53 FR 26153, July 11, 1988; 53 FR 30906, Aug. 16, 1988]

APPENDIX E TO PART 135—HELICOPTER FLIGHT RECORDER SPECIFICATIONS

Parameters	Range	Accuracy sensor input to DFDR readout	Sampling interval (per second)	Resolution ² read out
Time (GMT)	24 Hrs	±0.125% Per Hour	0.25 (1 per 4 seconds).	1 sec
Altitude	−1,000 ft to max certified altitude of aircraft.	±100 to ±700 ft (See Table 1, TSO-C51a).	1	5' to 30'.
Airspeed	As the installed measuring system.	±3%	1	1 kt
Heading	360°	±2°	1	0.5°.
Normal Acceleration (Vertical)	−3g to +6g	±1% of max range excluding datum error of ±5%.	8	0.01g
Pitch Attitude	±75°	±2°	2	0.5°
Roll Attitude	±180°	±2°	2	0.5°.
Radio Transmitter Keying	On-Off (Discrete) .....	.....	1	0.25 sec
Power in Each Engine: Free Power Turbine Speed and Engine Torque.	0–130% (power Turbine Speed) Full range (Torque).	±2%	1 speed 1 torque (per engine).	0.2% ¹ to 0.4% ¹